

Carl-Zeiss-Stiftung
trading as Carl Zeiss
Z8917-US FS/FB

5

What is claimed is:

1. A surgical microscopy system, comprising:

10 a surgical microscope;

a stand comprising a base and a plurality of pivotally
connected arms, the surgical microscope being mounted
to one of the arms, wherein the pivotally connected
15 arms are arranged to be movable with respect to each
other such that the surgical microscope is movable
relative to the base;

at least one light emitter, mounted on the surgical
20 microscope, for illuminating a field for surgery; and

a light guiding system for supplying light to the at
least one light emitter,

25 wherein the light guiding system comprises at least two
separate, flexible light guides mounted to at least a
pair of pivotally connected arms, which light guides
supply light to a single light emitter and are each
attached to a first arm of the pair of pivotally
30 connected arms at a first attachment position and a
second arm of the pair of pivotally connected arms at a
second attachment position disposed at a distance from
the first attachment position.

2. A surgical microscopy system, comprising:

a surgical microscope;

5

a stand comprising a base and a plurality of pivotally connected arms, the surgical microscope being mounted to one of the arms, wherein the pivotally connected arms are arranged to be movable with respect to each other such that the surgical microscope is movable relative to the base;

10

at least one light emitter, mounted on the surgical microscope, for illuminating a field for surgery; and

15

a light guiding system for supplying light to the at least one light emitter,

wherein the at least one light emitter comprises at least one of a light generating semiconductor device mounted on the surgical microscope, an organic light generating device mounted on the surgical microscope, and a light emitting polymer device mounted on the surgical microscope.

20

3. The surgical microscopy system according to claim 2, wherein the organic light generating device is an organic light emitting diode.

25

4. The surgical microscopy system according to claim 2, further comprising at least one electrochemical cell mounted on the surgical microscope, the at least one electrochemical cell being provided for generating electrical power and supplying electrical power to the at least one light emitter.

30

35

5. The surgical microscopy system according to claim 4, comprising a pair of electrochemical cells which are independently removable from the surgical microscope.
- 5 6. The surgical microscopy system according to claim 4, wherein the electrochemical cell comprises a fuel cell.
7. The surgical microscopy system according to claim 2, comprising at least two semiconductor devices, wherein
10 a first semiconductor device generates light of a wavelength range at least partially different from at least a wavelength range of light generated by a second semiconductor device.
- 15 8. The surgical microscopy system according to claim 7, wherein the light emitter comprises a light mixer configured such that the light generated by the at least two semiconductor devices is reflected a plurality of times before being emitted.
- 20 9. The surgical microscopy system according to claim 8, wherein the light mixer comprises a light guide, which is at least partially disposed around an objective lens of the surgical microscope, and wherein the light for
25 illuminating the field for surgery is emitted by the light guide.
10. A surgical microscopy system, comprising:
30 a surgical microscope;

a stand comprising a base and a plurality of pivotally connected arms, the surgical microscope being mounted to one of the arms, wherein the pivotally connected
35 arms are arranged to be movable with respect to each

other such that the surgical microscope is movable relative to the base;

5 at least one light emitter, mounted on the surgical microscope, for illuminating a field for surgery; and

10 a photoelectric cell for generating electrical current for operating the surgical microscope, the photoelectric cell being arranged such that at least one of a portion of the light emitted by the light emitter and a portion of light supplied to the light emitter is incident on the photoelectric cell.

11. The surgical microscopy system according to claim 10,
15 further comprising a beam splitter for separating off a portion of light to be supplied to the photoelectric cell from the light supplied to the light emitter.

12. The surgical microscopy system according to claim 11,
20 wherein the beam splitter is configured for separating off the portion of light to be supplied to the photoelectric cell from the light supplied to the light emitter only in a part of a range of wavelengths of the light supplied to the light emitter.

25

13. A surgical microscopy system, comprising:

a surgical microscope;

30 a stand comprising a base and a plurality of pivotally connected arms, the surgical microscope being mounted to one of the arms, wherein the pivotally connected arms are arranged to be movable with respect to each other such that the surgical microscope is movable
35 relative to the base;

wherein the surgical microscope comprises a device powered by electrical current and

5 wherein the surgical microscope further comprises a power supply for the device, and having a first electrically insulated wire for conducting a current to the device, and a second electrically insulated wire for conducting current back from the device, wherein the first and second conductors are each attached to a first arm of the stand at a first attachment position and attached to a second arm of the stand at a second attachment position, wherein the pair of electrically insulated wires is a twisted pair of wires.

15 14. A surgical microscopy system, comprising:

a surgical microscope;

20 a stand comprising a base and a plurality of pivotally connected arms, the surgical microscope being mounted to one of the arms, wherein the pivotally connected arms are arranged to be movable with respect to each other such that the surgical microscope is movable relative to the base;

25 wherein the surgical microscope comprises a device powered by electrical current and wherein the surgical microscope comprises a power supply of the device,

30 wherein the power supply comprises:

an AC generator,

35 an induction transmitter supplied with operating power by the AC generator, the induction transmitter being attached to a first arm of the stand, and

an induction receiver, the induction receiver being attached to a second arm of the stand such as to face the induction transmitter and to be movable relative thereto, the second arm being pivotally connected to the first arm, and

wherein the induction receiver supplies operating power to the device powered by electrical current.

15. A surgical microscopy system, comprising:

a surgical microscope; and

a stand comprising a base and a plurality of pivotally connected arms, the surgical microscope being mounted to one of the arms, wherein the pivotally connected arms are arranged to be movable with respect to each other such that the surgical microscope is movable relative to the base;

wherein the surgical microscope comprises a device powered by electrical current and wherein the surgical microscope comprises a power supply of the device,

the power supply comprising a contact rail disposed on a first arm and a sliding contact disposed adjacent to the contact rail, wherein the sliding contact is disposed on a second arm and wherein the second arm is pivotally connected to the first arm.

16. A surgical microscopy system, comprising:

a surgical microscope;

a stand comprising a base and a plurality of pivotally connected arms, the surgical microscope being mounted to one of the arms, wherein the pivotally connected arms are arranged to be movable with respect to each other such that the surgical microscope is movable relative to the base;

wherein the surgical microscope comprises a device powered by electrical current and wherein the surgical microscope comprises a power supply of the device, and

wherein a mechanically supporting component of the stand is configured to form part of a current path to or from the device powered by electrical current.

15

17. A surgical microscopy system, comprising:

a surgical microscope;

a stand comprising a base and a plurality of pivotally connected arms, the surgical microscope being mounted to one of the arms, wherein the pivotally connected arms are arranged to be movable with respect to each other such that the surgical microscope is movable relative to the base;

wherein the surgical microscope comprises a device powered by electrical current and wherein the surgical microscope comprises a power supply of the device, and

30

wherein the power supply comprises a radiation emitter disposed at a distance from the surgical microscope and a radiation receiver disposed on at least one of the surgical microscope and an arm of the stand, the radiation receiver being adapted to receive radiation

35

emitted by the radiation emitter and to transform the received radiation into an electrical current.

5 18. The surgical microscopy system according to claim 17,
wherein the radiation emitter is a directional transmitter, and wherein a control unit is provided for setting a direction of emission of the directional transmitter in dependence of a position of the radiation receiver.

10

19. The surgical microscopy system according to claim 17,
wherein the radiation is at least one selected from infrared radiation, microwave radiation and laser radiation.

15

20. A surgical microscopy system, comprising:

a surgical microscope;

20 a stand comprising a base and a plurality of pivotally
connected arms, the surgical microscope being mounted
to one of the arms, wherein the pivotally connected
arms are arranged to be movable with respect to each
other such that the surgical microscope is movable
25 relative to the base;

wherein the surgical microscope comprises a device
powered by electrical current and wherein the surgical
microscope comprises a power supply of the device, and

30

wherein the base of the stand is adapted to be disposed
on a floor of a room, wherein the base comprises an
induction receiver to be used in combination with at
least one induction transmitter disposed on or in the
35 floor of the room, and wherein the induction receiver

supplies the device powered by the electrical current with operating power.

21. A surgical microscopy system, comprising:

5

a surgical microscope;

10

a stand comprising a base and a plurality of pivotally connected arms, the surgical microscope being mounted to one of the arms, wherein the pivotally connected arms are arranged to be movable with respect to each other such that the surgical microscope is movable relative to the base; and

15

a data transmission system,

wherein the surgical microscope comprises at least one of a data acquisition unit and a data display unit, and

20

wherein the data transmission system for transmitting data comprises at least a pair of wires, each wire being electrically insulated, which wires are each attached to a first arm of the stand at a first attachment position and attached to a second arm of the stand at a second attachment position, wherein the pair of electrically insulated wires is a twisted pair of wires.

25

22. A surgical microscopy system, comprising:

30

a surgical microscope;

35

a stand comprising a base and a plurality of pivotally connected arms, the surgical microscope being mounted to one of the arms, wherein the pivotally connected arms are arranged to be movable with respect to each

other such that the surgical microscope is movable relative to the base; and

a data transmission system,

5

wherein the surgical microscope comprises at least one of a data acquisition unit and a data display unit, and

wherein the data transmission system comprises:

10

a transmitter attached to a first arm of the stand,

a data modulator connected to the transmitter,

15

a receiver attached to a second arm of the stand such that the receiver faces the transmitter and is movable with respect thereto, and

a data demodulator connected with the receiver.

20

23. The surgical microscopy system according to claim 22, wherein the transmitter comprises a induction transmitter and wherein the receiver comprises an induction receiver.

25

24. The surgical microscopy system according to claim 22, wherein the data demodulator is coupled to the data display unit.

30

25. The surgical microscopy system according to claim 22, wherein the data modulator is coupled to the data acquisition unit.

26. A surgical microscopy system, comprising:

a surgical microscope;

5

a stand comprising a base and a plurality of pivotally connected arms, the surgical microscope being mounted to one of the arms, wherein the pivotally connected arms are arranged to be movable with respect to each other such that the surgical microscope is movable relative to the base; and

10

a data transmission system,

15

wherein the surgical microscope comprises at least one of a data acquisition unit and a data display unit, and

wherein the data transmission system comprises a contact rail disposed on a first arm and a sliding contact disposed adjacent to the contact rail, wherein the sliding contact is disposed on a second arm and wherein the second arm is pivotally connected to the first arm.

20

25 27. A surgical microscopy system, comprising:

a surgical microscope;

a stand comprising a base and a plurality of pivotally connected arms, the surgical microscope being mounted to one of the arms, wherein the pivotally connected arms are arranged to be movable with respect to each other such that the surgical microscope is movable relative to the base; and

30

a data transmission system,

35

wherein the surgical microscope comprises at least one of a data acquisition unit and a data display unit, and

5 wherein a mechanically supporting component of the stand is configured to form part of a current path to or from the data acquisition unit or a data display unit, respectively.

10 28. The surgical microscopy system according to claim 27, wherein the data transmission system comprises a light guide.

29. A surgical microscopy system, comprising:

15

a surgical microscope;

20

a stand comprising a base and a plurality of pivotally connected arms, the surgical microscope being mounted to one of the arms, wherein the pivotally connected arms are arranged to be movable with respect to each other such that the surgical microscope is movable relative to the base; and

25

a data transmission system,

wherein the surgical microscope comprises at least one of a data acquisition unit and a data display unit, and

30

wherein the data transmission system comprises a light guide attached to at least one of the arms of the stand at a first attachment position.

30. A surgical microscopy system, comprising:

a surgical microscope;

5

a stand comprising a base and a plurality of pivotally connected arms, the surgical microscope being mounted to one of the arms, wherein the pivotally connected arms are arranged to be movable with respect to each other such that the surgical microscope is movable relative to the base; and

10

a data transmission system,

15

wherein the surgical microscope comprises at least one of a data acquisition unit and a data display unit, and

wherein the data transmission system comprises a waveguide arrangement for guiding electromagnetic waves, the waveguide arrangement extending across at least two adjacent arms of the stand.

20

31. A surgical microscopy system, comprising:

a surgical microscope;

25

a stand comprising a base and a plurality of pivotally connected arms, the surgical microscope being mounted to one of the arms, wherein the pivotally connected arms are arranged to be movable with respect to each other such that the surgical microscope is movable relative to the base; and

30

a data transmission system,

35

wherein the surgical microscope comprises at least one of a data acquisition unit and a data display unit, and

5 wherein the data transmission system comprises an optocoupler between two adjacent arms of the stand, which optocoupler transfers data from a first portion of the data transmission system on the first arm of the two adjacent arms to a second portion of the data transmission system on the second arm of the two
10 adjacent arms.

32. A surgical microscopy system, comprising:

15 a surgical microscope;

a stand comprising a base and a plurality of pivotally connected arms, the surgical microscope being mounted to one of the arms, wherein the pivotally connected arms are arranged to be movable with respect to each other such that the surgical microscope is movable
20 relative to the base; and

a data transmission system,

25 wherein the surgical microscope comprises at least one of a data acquisition unit and a data display unit, and

wherein the data transmission system comprises a data compressing unit for compressing data acquired by the data acquisition system and a data decompressing unit
30 for decompressing the data to be displayed by the data display unit.

33. The surgical microscopy system according to claim 31,
wherein the data to be transmitted comprise image data
and wherein the data compressing unit and the data
5 decompressing unit operate according to an MPEG4-
process.

34. A surgical microscopy system, comprising:

10 a surgical microscope;

a stand comprising a base and a plurality of pivotally
connected arms, the surgical microscope being mounted
to one of the arms, wherein the pivotally connected
15 arms are arranged to be movable with respect to each
other such that the surgical microscope is movable
relative to the base; and

a data transmission system,

20 wherein the surgical microscope comprises at least one
of a data acquisition unit and a data display unit,

wherein the surgical microscope further comprises a
25 device powered by electrical current,

wherein the data transmission system for transmitting
data comprises at least a pair of wires, each wire
being electrically insulated, which wires are each
30 attached to a first arm of the stand at a first
attachment position and attached to a second arm of the
stand at a second attachment position, wherein the pair
of electrically insulated wires is a twisted pair of
wires, and

wherein the surgical microscope further comprises a power supply for the device, and having a first electrically insulated wire for conducting a current to the device, and a second electrically insulated wire for conducting current back from the device, wherein the first and second conductors are each attached to a first arm of the stand at a first attachment position and attached to a second arm of the stand at a second attachment position, wherein the pair of electrically insulated wires is a twisted pair of wires,

and wherein at least one of the wires is configured for transmission of current and data.